

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Currently amended) A computer system with a storage system having
2 reconfigurable logical volumes comprising:
3 a plurality of computers;
4 a storage system operatively coupled to said computers and comprising a plurality
5 of inner logical volumes and an LU controller to control said inner logical volumes; and
6 a management console to communicate instructions to change a logical volume
7 configuration of said logical volumes,
8 said LU controller comprising an LUN map designating ~~a correlation~~ an
9 association among an outer LUN, one or more inner LUNs, and a computer ID, said outer LUN
10 designating an outer logical volume that can be accessed by one of said computers, each of said
11 inner LUNs designating one of said inner logical volumes whereby said outer logical volume can
12 be associated with one or more of said inner logical volumes, said computer ID designating one
13 of said computers,
14 ~~wherein in response to receiving said LU controller responsive to an instruction to~~
15 ~~change said logical volume configuration, said LU controller is configured such that it modifies~~
16 ~~by modifying said LUN map according to said instruction, to correlate a first outer LUN and a~~
17 ~~first computer ID with a second inner LUN, said first outer LUN and said first computer ID~~
18 ~~being previously correlated with a first inner LUN, wherein a computer designated by said first~~
19 ~~computer ID detects a change in said logical volume configuration so that said computer can~~
20 ~~subsequently access an inner logical volume designated by said second inner LUN by way of~~
21 ~~said first outer LUN.~~
22 wherein prior to said LUN map being modified, a first outer LUN and a first
23 computer ID are associated with a first inner LUN,

24 wherein subsequent to said LUN map being modified, said first outer LUN and
25 said first computer ID are associated with a second inner LUN different from said first inner
26 LUN.

1 2 - 13. (Canceled)

1 14. (Previously presented) A computer system of claim 1, wherein each of
2 said plurality of computers searches an outer logical volume by using an outer LUN.

1 15. (Currently amended) A computer system of claim 1, wherein subsequent
2 to said LUN map being modified, said first outer LUN and said first computer ID are further
3 associated with said first inner LUN as well as said second inner LUN, wherein storage capacity
4 of said outer logical volume designated by said first outer LUN is expanded into comprises
5 combined storage capacities of area including inner logical volumes designated by said first
6 inner LUN and said second inner LUN.

1 16. (Previously presented) A computer system of claim 15, wherein said
2 instruction to change a logical volume configuration includes said first inner LUN and said
3 second inner LUN.

1 17. (Currently amended) A computer system ~~of claim 1, comprising:~~
2 a plurality of computers; and
3 a storage system in data communication with said computers, said storage system
4 comprising a plurality of logical volumes designated as inner logical volumes and a LUN map,
5 said LUN map identifying an association among a first outer LUN, a first computer ID, and a
6 first inner LUN, said first outer LUN designating an outer logical volume wherein a computer
7 identified by said first computer ID can access said outer logical volume using said first outer
8 LUN, whereby said first inner LUN is accessed when said outer logical volume is accessed,
9 said storage system operative to receive a LUN configuration change instruction
10 designating said first inner LUN and a storage capacity indication,

11 wherein if there is a second inner LUN having a storage capacity equal to or
12 greater than a sum of a storage capacity of said first inner LUN and said storage capacity
13 indication, then said storage system is operative to respond to said LUN configuration change
14 instruction by copying information stored on said first inner LUN to said second inner LUN and
15 modifying said LUN map so that said first outer LUN and said first computer ID are associated
16 with said second inner LUN,

17 wherein subsequent to said LUN configuration change instruction, said second
18 inner LUN is accessed when said outer logical volume is accessed.

19 ~~wherein said instruction to change a logical volume configuration includes said~~
20 ~~first LUN and a requested size,~~

21 ~~said storage system and said LU controller configured such that if a free storage~~
22 ~~area having a size larger than the sum of said requested size and the size of an inner logical~~
23 ~~volume designated by said first LUN exists in said storage system, then said storage system~~
24 ~~copies data stored in said inner logical volume to said free storage area and said LU controller~~
25 ~~rewrites said LUN map to correlate said free storage area with said second inner LUN and to~~
26 ~~correlate said second inner LUN with said first outer LUN and with said first computer ID.~~

1 18. (Currently amended) A computer system of claim 1,
2 wherein said instruction to change a logical volume configuration includes said
3 first inner LUN and a requested size,
4 wherein said LU controller is configured such that if a free storage area exists
5 which has a size that is larger than said requested size plus the size of said inner logical volume
6 designated by said first inner LUN, then said LU controller copies data stored in said inner
7 logical volume designated by said first inner LUN to said free storage area, and rewrites said
8 LUN map to correlate said free storage area with said first outer LUN, with said first computer
9 ID, and with said second inner LUN, said second inner LUN being associated with said free
10 storage area,
11 wherein said LU controller is further configured such that if such a free storage
12 area does not exist in said storage system, then said LU controller rewrites said LUN map to

- 13 correlate said first outer LUN with said logical volume designated by said first inner LUN and
14 with any free storage area in said storage system.

- 1 19. (New) A computer system of claim 17, wherein each of said plurality of
2 computers searches an outer logical volume by using an outer LUN.